Instruction Manual 0101-8321-1
L&SP 4785

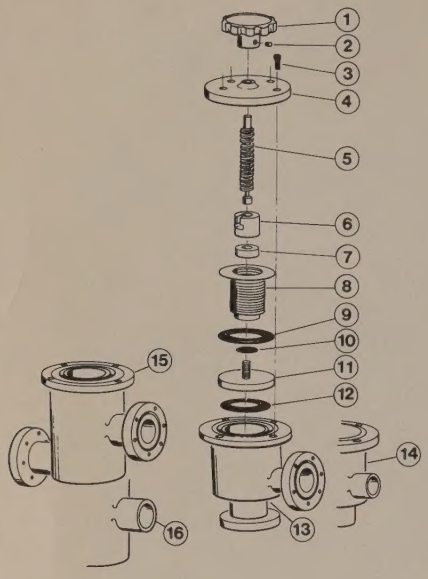
AIRCO Temescal

SERIES 2000
STAINLESS STEEL VALVES
INSTRUCTIONS

MP MASTER
MA32748

Airco Temescal, 2850 Seventh Street, Berkeley, California 94710 • Telephone: 415-841-5720, TWX: 910-366-7366

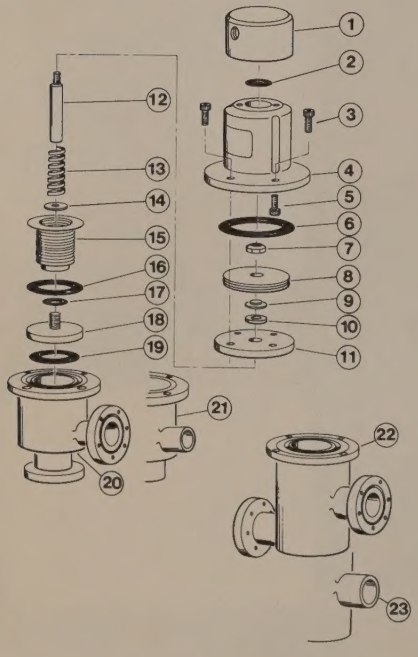
HANDWHEEL ACTUATION



PART NUMBERS
ITEMS 1 THROUGH 12 ARE COMMON TO ALL VALVE MODELS

ITEM	PART	5/8	1 1/8	1 1/2
1	Knob	0222-9811-0	0222-9811-0	0222-9811-0
2	Set screw, knob	1214-1754-0	1214-1754-0	1214-1754-0
3	Screw	1221-1754-0	1221-1755-0	1221-1854-0
4	Bonnet	0222-2113-0	0222-2123-0	0222-2133-0
5	Stem	0222-2512-0	0222-2522-0	0222-2532-0
6	Disc nut	0322-5592-0	0322-5392-0	0322-5392-0
7	Spacer	0322-5671-0	0322-5671-0	0322-9301-0
8	Bellows	0322-5501-0	0322-5401-0	0322-5601-0
9	O-ring, body, Viton	2231-0223-1	2231-0255-1	2231-0230-1
10	O-ring, bellows seal, Viton	2231-0110-1	2231-0110-1	2231-0110-1
11	Disc	0322-5582-0	0322-5382-0	0322-5482-0
12	O-ring, disc, Viton	2231-0211-1	2231-0218-1	2231-0224-1
13	Right angle body, Conflat flange fitting—Type 2010	0322-9033-0 (5/8")	0322-9033-2 (1 /8")	0322-9033-2 (1 1/2")
14	Right angle body weld—Type 2010	0322-5553-0 (5/8")	0322-5353-0 (1 /8")	0322-5453-0 (1 1/2")
15	Inline body, Conflat flange fitting—Type 2110	0122-3403-1 (5/8")	0122-3403-2 (1 /8")	0122-3403-3 (1 1/2")
16	Inline body weld—Type 2110	0222-4513-0 (5/8")	0222-4523-0 (1 /8")	0222-4533-0 (1 1/2")
		COMPLETE GASKET KIT		
	Viton	0322-5951-0	0322-5961-0	0322-5971-0

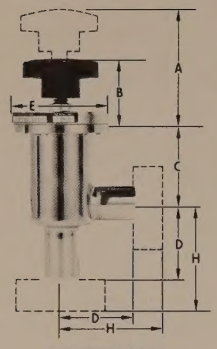
REMOTE PNEUMATIC ACTUATION (THE FINISHED VALVE IS NO LONGER MANUFACTURED BUT SPARE PARTS ARE AVAILABLE)



PART NUMBERS
ITEMS 1 THROUGH 19 ARE COMMON TO ALL VALVE MODELS

ITEM	PART	5/8	1 1/8	1 1/2
1	Pneumatic Adapter	0222-3112-0	0222-3112-0	0222-3112-0
2	O-ring, Pneumatic adapter	2130-0116-0	2130-0116-0	2130-0116-0
3	Screw, body mounting	1221-1758-0	1221-1759-0	1221-1859-0
4	Air cylinder	0222-2013-0	0222-2023-0	0223-2033-0
5	Screw, adapter mounting	1221-1755-0	1221-1755-0	1221-1755-0
6	O-ring, air cylinder	2130-0224-0	2130-0225-0	2130-0230-0
7	Locknut	1267-1901-0	1267-1901-0	1267-1901-0
8	Piston	9210-8158-0	9210-8134-0	9210-8214-0
9	Piston adapter	————	————	0222-3512-0
10	Stem seal	2108-0110-0	2108-0110-0	2108-0110-0
11	Bonnet	0222-2313-0	0222-2323-0	0222-2333-0
12	Stem	0222-2812-0	0222-2822-0	0222-2832-0
13	Spring	0322-7071-0	0322-7081-0	0322-7091-0
14	Spacer	0322-9301-0	0322-9561-0	0322-7981-0
15	Bellows	0322-5501-0	0322-5401-0	0322-5601-0
16	O-ring, body, Viton	2231-0223-1	2231-0225-1	2231-0230-0
17	O-ring, bellows seal, Viton	2231-0110-1	2231-0110-1	2231-0110-1
18	Disc	0322-5582-0	0322-5382-0	0322-5482-0
19	O-ring, disc, Viton	2231-0211-1	2231-0218-1	2231-0224-1
20	Right angle body, Conflat flange fitting—Type 2031	0322-9033-0 (5/8")	0322-9033-2 (1 /8")	0322-9033-3 (1 1/2")
21	Right angle body weld—Type 2031	0322-5553-0 (5/8")	0322-5353-0 (1 /8")	0322-5453-0 (1 1/2")
22	Inline body, Conflat flange fitting—Type 2131	0122-3403-1 (5/8")	0122-3403-0(1 /8")	0122-3403-0 (1 1/2")
23	Inline body weld—Type 2131	0222-4513-0 (5/8")	0222-4532-0 (1 /8")	0222-4533-0 (1 1/2")
		COMPLETE GASKET KIT		
	Viton	0322-5951-0	0322-5961-0	0322-5971-0

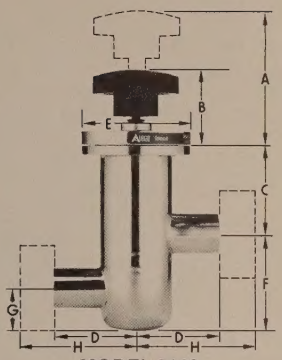
SERIES 2000 STAINLESS STEEL VALVES



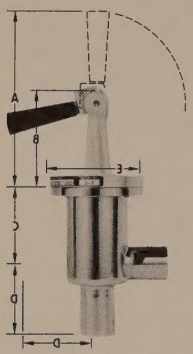
MODEL 2010

HANDWHEEL ACTUATION

PORT SIZE (O.D.)	DIMENSIONS — INCHES A (Open)	B (Closed)	C	D	E (Dia.)	F	G	H	WT. LBS.
5/8	2 7/16	2	1 15/16	2 1/4	2 3/4	2	7/8	2 13/32	1 1/4
1 1/8	2 3/4	1 7/8	2 1/2	2 1/4	3	2 13/16	1 1/8	2 13/32	2 1/2
1 1/2	2 15/16	1 13/16	3 1/8	2 1/4	3 7/8	3 3/8	1 5/16	2 13/32	3 3/4



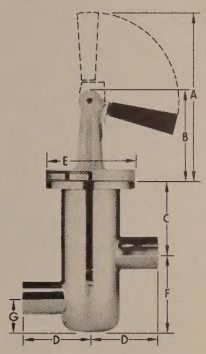
MODEL 2110



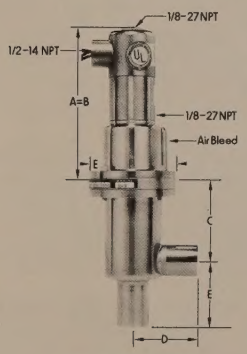
MODEL 2020

TOGGLE ACTUATION

PORT SIZE (O.D.)	DIMENSIONS — INCHES A	B	C	D	E (Dia.)	F	G	H	WT. LBS.
5/8	5 9/16	3 1/16	1 15/16	2 1/4	2 3/4	2	7/8		1 1/8
1 1/8	5 9/16	3 1/16	2 1/2	2 1/4	3	2 13/16	1 1/8		2 1/4
1 1/2	5 9/16	3 1/16	3 1/8	2 1/4	3 7/8	3 3/8	1 5/16		3 1/2



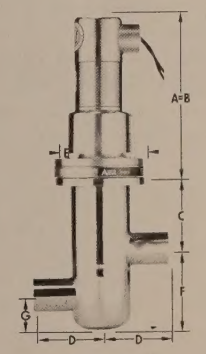
MODEL 2120



MODEL 2030

ELECTROPNEUMATIC ACTUATION

PORT SIZE (O.D.)	DIMENSIONS — INCHES A	B	C	D	E (Dia.)	F	G	H	WT. LBS.
5/8	5 3/8	5 3/8	1 15/16	2 1/4	2 3/4	2	7/8		2 1/2
1 1/8	5 5/8	5 5/8	2 1/2	2 1/4	3	2 13/16	1 1/8		4 1/4
1 1/2	6 1/16	6 1/16	3 1/8	2 1/4	3 7/8	3 3/8	1 5/16		6



MODEL 2130

SPECIFICATIONS (conductance)

Size	Liters/sec (air at 25°C) Angle	In-Line
5/8	2	1
1 1/8	14	10
1 1/2	40	30

MATERIAL

Bellows assembly:	304 Stainless Steel
Body:	304 Stainless Steel
O-rings:	Low set fluorocarbon (MIL SPEC: MIL-R-25897E)
Sealing disc:	304 Stainless Steel

ORDERING INSTRUCTIONS

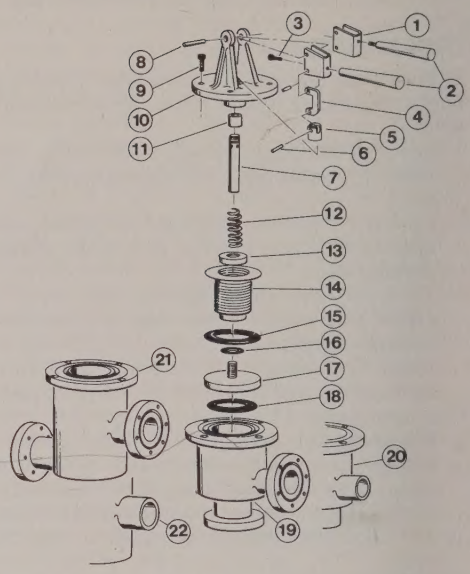
Include: Quantity / Size / Series / Options

Example: 4 each 1 1/2" Series 2030 with rotatable metal-sealed flanges

TOGGLE ACTUATION

PART NUMBERS
ITEMS 1 THROUGH 18 ARE COMMON TO ALL VALVE MODELS

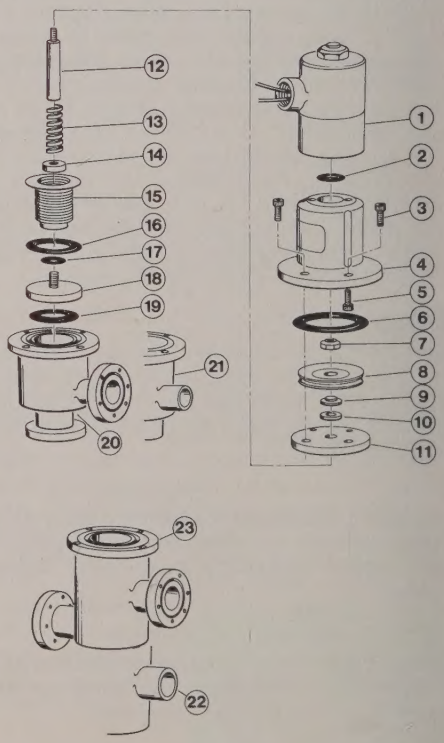
ITEM	PART	5/8	1 1/8	1 1/2
1	Rotary Link Assembly Rotary Link	0222-3412-0	0222-3422-0	0222-2432-0
2	Handle	9012-0226-0	9012-0226-0	9012-0692-0
3	Screw, handle	————	————	1219-1857-0
4	Pivot link	0222-1662-0	0222-1662-0	0222-1662-0
5	Link pins	1206-1357-0	1206-1357-0	1206-1357-0
6	Adjusting nut	0222-3062-0	0222-3062-0	0222-3062-0
7	Stem	0222-2712-0	0222-2722-0	0222-2732-0
8	Stationary pin	1206-1669-0	1206-1669-0	1206-1669-0
9	Screw	1221-1754-0	1221-1755-0	1221-1854-0
10	Bonnet Assembly	0222-2213-0	0222-2223-0	0222-2233-0
11	Bushing (part of item 10)	1186-0612-0	1186-0612-0	1186-0612-0
12	Spring	0322-6221-0	0322-6231-0	0322-6241-0
13	Spacer	0322-5671-0	0322-5671-0	0322-9301-0
14	Bellows	0322-5501-0	0322-5401-0	0322-5601-0
15	O-ring, body, Viton	2231-0223-1	2231-0225-1	2231-0230-1
16	O-ring, bellows seal, Viton	2231-0110-1	2231-0110-1	2231-0110-1
17	Disc	0322-5582-0	0322-5382-0	0322-5482-0
18	O-ring, disc, Viton	2231-0211-1	2231-0218-1	2231-0224-1
19	Right angle body, Conflat flange fitting—Type 2020	0322-9033-0 (5/8")	0322-9033-2 (1 /8")	0322-9033-3 (1 1/2")
20	Right angle body weld—Type 2020	0322-5553-0 (5/8")	0322-5353-0 (1 /8")	0322-5453-0 (1 1/2")
21	Inline body, Conflat flange fitting—Type 2120	0122-3403-1 (5/8")	0122-3403-2 (1 /8")	0122-3403-3 (1 1/2")
22	Inline body weld—Type 2120	0222-4513-0 (5/8")	0222-4523-0 (1 /8")	0222-4533-0 (1 1/2")
		COMPLETE GASKET KIT		
	Viton	0322-5951-0	0322-5961-0	0322-5871-0



ELECTROPNEUMATIC ACTUATION

PART NUMBERS
ITEMS 1 THROUGH 19 ARE COMMON TO ALL VALVE MODELS

ITEM	PART	5/8	1 1/8	1 1/2
1	Solenoid, stnd norm, closed, 115V, 60HZ	9203-4435-0	9203-4435-0	9203-4435-0
	Solenoid, norm closed, 115V, 60HZ, explosion proof	9203-2130-0	9203-2130-0	9203-2130-0
	Solenoid, norm open, 115V, 60HZ	9203-2611-0	9203-2611-0	9203-2611-0
	Solenoid, norm open, 115V, 60HZ, explosion proof	9203-6110-0	9203-6110-0	9203-6110-0
	Coil, solenoid, 24V, DC	9203-3024-0	9203-3024-0	9203-3024-0
	Coil, solenoid, 230V, 60HZ	9203-3424-0	9203-3424-0	9203-3424-0
	Coil, solenoid, 220V, 50HZ	9203-6341-0	9203-6341-0	9203-6341-0
	Coil, solenoid, 110V, 50HZ, European service	9203-6321-0		
2	O-ring, solenoid	2130-0116-0	2130-0116-0	2130-0116-0
3	Screw, body mounting	1221-1758-0	1221-1759-0	1221-1859-0
4	Air cylinder	0222-2013-0	0222-2023-0	0222-2033-0
5	Screw, solenoid mounting	1221-1755-0	1221-1755-0	1221-1755-0
6	O-ring, air cylinder	2130-0224-0	2130-0225-0	2130-0230-1
7	Lock nut, piston	1267-1901-0	1267-1901-0	1267-1901-0
8	Piston	9210-8158-0	9210-8134-0	9210-8214-0
9	Piston adapter	————	————	0222-3512-0
10	Stem seal	2108-0110-0	2108-0110-0	2108-0110-0
11	Bonnet	0222-2313-0	0222-2323-0	0222-2333-0
12	Stem	0222-2812-0	0222-2822-0	0222-2832-0
13	Spring	0322-7071-0	0322-7081-0	0322-7091-0
14	Spacer	0322-9301-0	0322-9561-0	0322-7981-0
15	Bellows	0322-5501-0	0322-5401-0	0322-5601-0
16	O-ring, body, Viton	2231-0223-1	2231-0225-1	2231-0230-1
17	O-ring, bellows seal, Viton	2231-0110-1	2231-0110-1	2231-0110-1
18	Disc	0322-5582-0	0322-5382-0	0322-5482-0
19	O-rings, disc, Viton	2231-0211-1	2231-0218-1	2231-0224-1
20	Right angle body, Conflat flange fitting—Type 2030	0322-9033-0 (5/8")	0322-9033-2 (1 /8")	0322-9033-3 (1 1/2")
21	Right angle body weld—Type 2030	0322-5553-0 (5/8")	0322-5353-0 (1 /8")	0322-5453-0 (1 1/2")
22	Inline body weld—Type 2130	0222-4513-0 (5/8")	0222-4523-0 (1 /8")	0222-4533-0 (1 1/2")
23	Inline body, Conflat flange fitting—Type 2130	0122-3403-1 (5/8")	0122-3403-2 (1 /8")	0122-3403-3 (1 1/2")
		COMPLETE GASKET KIT		
	Viton	0322-5951-0	0322-5961-0	0322-5971-0



Unpacking

When unpacking the valve, inspect for any damage that may have occurred during transit. Report any apparent damage to the transportation company immediately.

Installation

Ensure that the valve and adjacent piping are adequately supported in the vacuum system and install the valve as follows:

1. Remove the plastic plugs installed in the valve ports. Inspect the valve body and piping for rough edges, lint, and dust.
2. Remove the entire actuator assembly, including bellows and o-rings, and store it in a clean plastic bag for reassembly later.
3. Although the valve can operate with the vacuum on either side of the valve seat, it is better to connect the vacuum piping so the vacuum is on the underside of the valve. The pressure differential will then keep the valve closed and will eliminate the need to pump out the body cavity on pumpdown.
4. Plumbing connection: The 2000 series valves are designed to be either flanged or heli-arc welded into the vacuum system plumbing. If not flanged, the valve is normally butt-welded to the same size tubing as the port. Do not use silver solder because it might warp the valve seat.
5. Reinstall the actuator assembly into the body of the valve as follows:
   Hand-operated types: The actuator assembly should be in the open position (handwheel or toggle up) before inserting it into the body of the valve. Tighten the four socket-head screws evenly until metal to metal contact is attained between the body and the bonnet of the actuator assembly. Number 10 screws are torqued to 20 in-lbs and 1/4-inch-diameter screws to 35 in-lbs.
   Electropneumatic: Carefully insert the actuator assembly into the body of the valve. Tighten the four socket-head screws evenly until metal to metal contact is attained between the valve body and the bonnet of the actuator assembly. Number 10 screws are torqued to 20 in-lbs and 1/4-inch-diameter screws to 35 in-lbs. Connect the compressed air supply to the valve with 1/8 pipe fittings using Teflon tape on the threads to ensure leak-proof joints. For trouble-free operation, install an air filter/lubricator in the air line system. Check the solenoid nameplate for correct voltage before connecting the valve to electric power. Carefully check the operation of the valve with 60 - 125 psig air pressure.

Operation

Airco Temescal valves are designed for reliable, trouble-free operation. The basic maintenance requirements are to keep the valve clean and the bonnet tight to seal out contaminants. Valves operated below 60 psig may not open fully or consistently.

CAUTION

Under no circumstances should the valves be operated above their 125 psig rating. Operation above rating will render actuating mechanism inoperable over time.

CAUTION

Handwheel actuated valves should not be excessively tightened. This action will not eliminate leaks and may result in damage to the valve seat.

Maintenance

Recommended cleaning agents

Metal parts (including valve body and bellows): acetone.
O-rings: methyl alcohol.

Recommended lubricants/grease

Bellows seal and valve seal o-ring gaskets: Dow Corning high vacuum grease; Apiezon grease H, L, M, T, or AP100.
Air o-rings only: Parker O-Lube.
Actuating mechanism: light machine oil.

A regular schedule of maintenance will help assure trouble-free operation of the valve. At 1,000 cycle intervals the valve should be checked to see that it is clean and that the bonnet is tightly sealed to the body. Check the actuation to make sure that it is smooth and apply light machine oil to the actuation threads of the handwheel valves.

At 5,000 cycle intervals the bellows and o-rings should be leak checked for possible wear and replaced if necessary. At 10,000 cycle intervals carefully remove the actuator assembly from the valve and disassemble it for cleaning and replace any worn parts. On the handwheel type hold the Teflon nut, located inside the bellows, with a screwdriver in order to unscrew the disc. On electropneumatic actuation valves the bellows assembly is under heavy spring tension. A press or specially adapted vise should be used to carefully compress the bellows assembly when unscrewing the stem.

DANGER

Do not unscrew this assembly without using the press or adapted vise, or the parts will fly apart, possibly injuring personnel.

The same procedure should be used to compress the spring when reassembling the valve.

Acetone should be used to clean the interior surfaces of the valve and metal parts. The o-rings should be cleaned with methyl alcohol.

CAUTION

Do not use acetone on the o-rings. Permanent damage to rings will result.

Check the bellows for vacuum tightness and the o-rings for smoothness and elasticity. It is recommended that the disc o-ring be replaced at this time.

Reassemble the valve using the recommended greases.

WARRANTY

MECHANICAL WARRANTY: For a period of twelve (12) months from the date of original shipment to Purchaser thereof, the apparatus and each part or component manufactured by the Airco Temescal Division of Airco, Inc. ("Airco") is warranted to be free from functional defects in materials and workmanship. The foregoing warranty is subject to the condition that the apparatus, part or component be properly operated under conditions of normal use and that regular periodic maintenance and service be performed or replacements made in accordance with instructions provided by Airco. The foregoing warranty shall not apply to any apparatus, part or component that has been repaired other than by Airco or an authorized Airco representative or in accordance with written instructions provided by Airco, that has been altered by anyone other than Airco or that has been subject to improper installation or abuse, misuse, negligence, accident or corrosion.

Purchaser's sole and exclusive remedy under the above warranty is limited to, at Airco's option, repair or replacement of defective parts or components or return to Purchaser of the price of the apparatus. Any such obligation on Airco's part is subject to the following requirements: (x) the defect must be promptly reported to Airco; (y) if so advised by Airco, Purchaser must return the part or component with a statement of the observed deficiency not later than seven (7) days after the expiration date of the warranty to the address designated by Airco, during normal business hours, transportation charges prepaid; and (z) upon examination by Airco, the part or component must be found not to comply with the above warranty. Return trip transportation charges for the part or component shall be paid by Purchaser. In the event that Airco elects to refund the purchase price, the apparatus shall be the property of Airco and shall be promptly shipped to Airco at Airco's expense. This Mechanical Warranty shall be void and the apparatus shall be deemed to be purchased AS IS in the event that the entire purchase price has not been paid within thirty (30) days of original shipment of the apparatus.

THERE ARE NO EXPRESS OR IMPLIED WARRANTIES THAT EXTEND BEYOND THE WARRANTY HEREINABOVE SET FORTH. THERE IS NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE APPARATUS OR ANY PART OR COMPONENT THEREOF AND NO WARRANTY SHALL BE IMPLIED BY LAW.

Items not of Airco's manufacture but resold by Airco are the products of other manufacturers and their warranty, if any, shall apply. THERE ARE NO WARRANTIES OF ANY KIND ON PRODUCTS OF OTHER MANUFACTURERS RESOLD BY AIRCO, EXCEPT THE WARRANTY OF TITLE, AND NO WARRANTIES SHALL BE IMPLIED BY LAW. THERE IS NO EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO PRODUCTS OF OTHER MANUFACTURERS.

PERFORMANCE WARRANTY: Airco warrants that the apparatus will comply with the specifications set forth in the purchase order. All specifications are subject to the corrections and tolerances allowed by the NEC. If the purchase order expressly provides for factory testing to verify compliance with the specifications, the Purchaser shall be entitled to witness the testing and the results of the testing. Upon demonstration of compliance with the specifications by factory testing, Airco's liability for failure to comply with the specifications shall terminate. In the event that the purchase order does not describe a comprehensive test program for demonstration of compliance with the specifications, Airco's test program (which may incorporate extrapolation of data or test results based upon similarity of criteria established by Airco) shall be used for such purpose.

If the purchase order does not expressly provide for factory testing, compliance with the specifications shall be demonstrated by field testing which shall be conducted by Purchaser at Purchaser's expense. Airco shall have the right to: (a) witness the field testing and to verify the results of such field testing; (b) have free access to all data compiled by the Purchaser in connection with any field test; and (c) conduct its own field test at its own expense during any 14-day consecutive period which may be mutually agreed upon by Airco and the Purchaser; provided, however, that Airco shall have the right to field test within six months of receipt from the Purchaser of any notice of failure to comply with the specifications. If compliance with the specifications is to be demonstrated by field testing, the Purchaser shall conduct and complete all field testing within sixty (60) days of the original shipment of the apparatus and shall promptly notify Airco of any failure to comply with the specifications. Airco shall not be liable for any failure to comply with the specifications demonstrated by field testing unless it receives notice thereof within sixty-seven (67) days of the date of original shipment of the apparatus.

In the event that factory testing or field testing does not demonstrate compliance with the specifications, the Purchaser's sole and exclusive remedy under the above warranty is limited to, at Airco's option, repair or replacement of defective parts or components or return to the Purchaser of the purchase price of the apparatus. In the event that Airco elects to refund the purchase price, the apparatus shall be the property of Airco.

Any obligations on Airco's part under this Performance Warranty are subject to the following requirements: (x) the nature of the failure of the apparatus to comply with the specifications must be promptly reported to Airco in writing; (y) if the apparatus has been delivered and field tested, the Purchaser must return the apparatus or any part or component to Airco upon its request, not later than sixty-seven (67) days after initial shipment to Purchaser, to the address designated by Airco, during normal business hours, transportation charges prepaid; and (z) upon examination and testing by Airco, the apparatus must be found not to comply with the specifications. Return trip transportation charges for the apparatus or any part or component shall be paid by the Purchaser. This Performance Warranty shall be void and the apparatus shall be deemed to be purchased AS IS in the event that the entire purchase price has not been paid within thirty (30) days of original shipment of the apparatus.

THERE ARE NO EXPRESS OR IMPLIED WARRANTIES THAT EXTEND BEYOND THE WARRANTY HEREINABOVE SET FORTH. THERE IS NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE APPARATUS OR ANY PART OR COMPONENT THEREOF AND NO WARRANTY SHALL BE IMPLIED BY LAW.

DISCLAIMER OF LIABILITY: IN NO EVENT SHALL AIRCO BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, ARISING FROM ANY SOURCE such as, but not limited to, the manufacture, use, delivery (including late delivery) or transportation of any apparatus, part or component sold to Purchaser, whether such damages are caused by Airco's negligence or otherwise. Without limiting the generality of the foregoing sentence, Airco shall not be liable for: the cost of capital; the cost of substitute apparatus, services, repairs, components or parts; loss of profit or revenue; the cost of power whether purchased or produced by the consumer thereof; loss of use of the apparatus or any part thereof, or any other property owned by Purchaser; claims or costs of Purchaser's customers; injuries to persons or death; or damages to ar
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